

## ASSETS AT RISK

As part of the State Fire Plan, CDF has developed a methodology for analyzing Assets at Risk (AAR). Using their methodology, OCFA has identified the Assets at Risk categories that apply to the county and the following table represents these Assets and the methodology used in ranking them.

Asset at Risk	Public Issue Category	Location and ranking methodology
Fire-flood watersheds	Public safety Public welfare	Watersheds with a history of problems or proper conditions for future problems (South Coastal Plain, field/stakeholder input), ranked based on affected downstream population
Soil erosion	Environment	Ranking of post-fire erosion potential based on weighted combination of fuel characteristics, soil k-factor, slope, and peak rainfall.
Scenic	Public welfare	Four mile viewshed around Scenic Highways and 1/4 mile viewshed around Wild and Scenic Rivers, ranked based on potential impacts to vegetation types (tree versus non-tree types)
Range	Public welfare	Rangelands ranked based on potential replacement feed cost by region/owner/vegetation type
Air quality	Public health Environment Public welfare	Potential damages to health, materials, vegetation, and visibility; ranking based on vegetation type and air basin
Historic buildings	Public welfare	Historic buildings ranked based on fire susceptibility
Recreation	Public welfare	Unique recreation areas or areas with potential damage to facilities, ranked based on fire susceptibility
Structures	Public safety Public welfare	Ranking based on housing density and exposure (potential for structure loss in a large fire event)
Non-game wildlife	Environment Public welfare	Public and NGO land holdings specifically for protection of non-game wildlife habitat, ranked based on fire susceptibility.
Infrastructure	Public safety Public welfare	Infrastructure for delivery of emergency and other critical services (e.g. repeater sites, transmission lines)
Ecosystem Health	Environment	Ranking based on condition class, potential for ecological damage from a severe fire event due to deviation from historical fire return interval

The asset framework and validation process will be refined as stakeholders are identified and are participating in the Fire Plan process. Agencies, such as The Nature Conservancy, have played a vital role in identifying the assets within Orange County.

Knowledge of the types and magnitudes of assets at risk to wildland fire, as well as their locations, is critical to fire protection planning. Given the limits on fire protection resources, they should be allocated, in part, based on the magnitude of the assets being protected. Knowledge of assets at risk is necessary to choose those pre-fire management projects that will provide the greatest benefit for a given amount of investment. At this stage of

development of the *Wildland Fire Management Plan*, OCFA's primary concern is reducing the fire risk and potential loss of the various assets described here in an effort to provide for the safety and protection of life and property while reducing suppression costs.

The AAR analysis used a common unit called the quad 81<sup>st</sup>. Each quad 81<sup>st</sup> must be ranked as High, Medium, or Low for each AAR based on potential impacts from a large fire event, if one were to occur. Rankings are developed based on the potential physical fire effects as well as the human valuation of those effects. For example, for the air quality AAR the physical effects of a large fire in timberlands are higher than grasslands due to production of a larger volume of smoke. The valuation of this effect will differ based on the additional factor of how many people are potentially affected within specific air basins.

The potential physical effects of a large fire also include a susceptibility component for assets such as structures, historic buildings, or recreation that involve specific sites within a quad 81<sup>st</sup>. For example, the ranking procedure for structures involves both a valuation component based on the number of housing units within a grid cell as well as a susceptibility component, or exposure. The exposure measure includes site-specific factors near housing such as vegetation clearance, roof type, and accessibility.

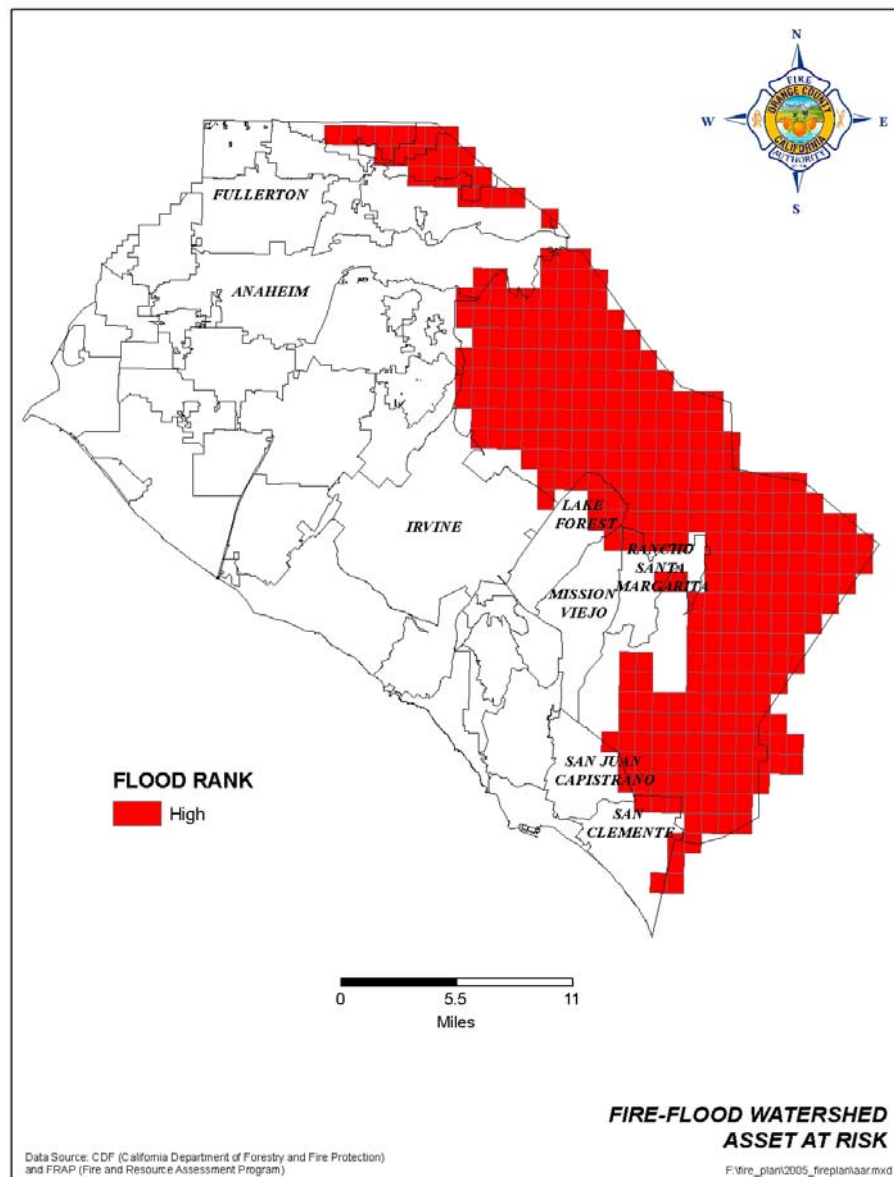
## **1. Fire-Flood Watersheds**

The California Fire Plan describes the potential for certain watersheds to produce fire-flood sequences. These watersheds can burn in the dry season and then discharge torrents of debris into downstream-populated plains during severe storms in following wet seasons. Historically, California's South Coastal Plain has suffered the worst effects of the flood-fire sequence; because it has the greatest concentration of fire prone, high debris producing watersheds that discharge into populated areas. Impacts include damage to downstream values such as homes, roads, debris basins, and other infrastructure. As an initial statewide approach, watersheds in the general area that has proved to be fire-flood prone in the past have been extracted from the statewide 1:24,000 scale CALWATER watershed data. While the initial statewide data are limited to the South Coastal Plain, the fire-flood sequence is not limited to these areas alone, and additional watersheds may be identified in other parts of the state through the Unit validation process.

For quad 81<sup>st</sup> that contain portions of a watershed prone to the fire-flood sequence, rankings are assigned based on the potentially affected downstream population from 1990 census data.

<b>RANK</b>	<b>AFFECTED DOWNSTREAM POPULATION*</b>
High	High: over 2500 per square mile
Medium	Medium: 100-2500 per square mile
Low	Low: less than 100 per square mile
Not ranked	Watershed not fire-flood prone

\* Original rankings based on 1990 census, update to 2000 census has not been performed since at the broad scale at which downstream populations are calculated it would probably results in extremely minor changes in the rankings.



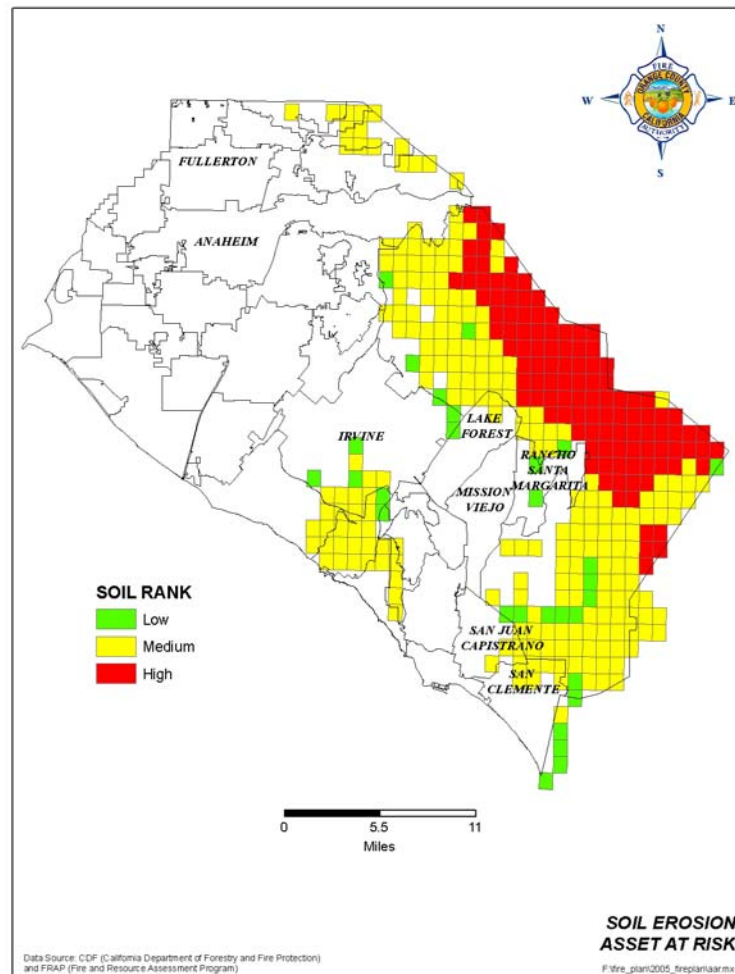
## 2. Soil Erosion

The Post-fire erosion potential is calculated as a combination of,

Slope  
Soil k-factor  
Fuel characteristics  
Peak rainfall

A score for each cell is derived as a weighted summation of these factors. The range of scores was then analyzed to assign the three ranks.

The methodology is designed to provide a reasonable statewide depiction of the spatial variation in post-fire soil erodibility. If the rankings do not adequately represent the local situation, field validation is not an option. Options are to locate better data inputs, or have FRAP adjust the methodology to fit local conditions, for example by changing the weighting scheme. Due to these restraints OCFA accepted the rankings as is and will validate at a later time.

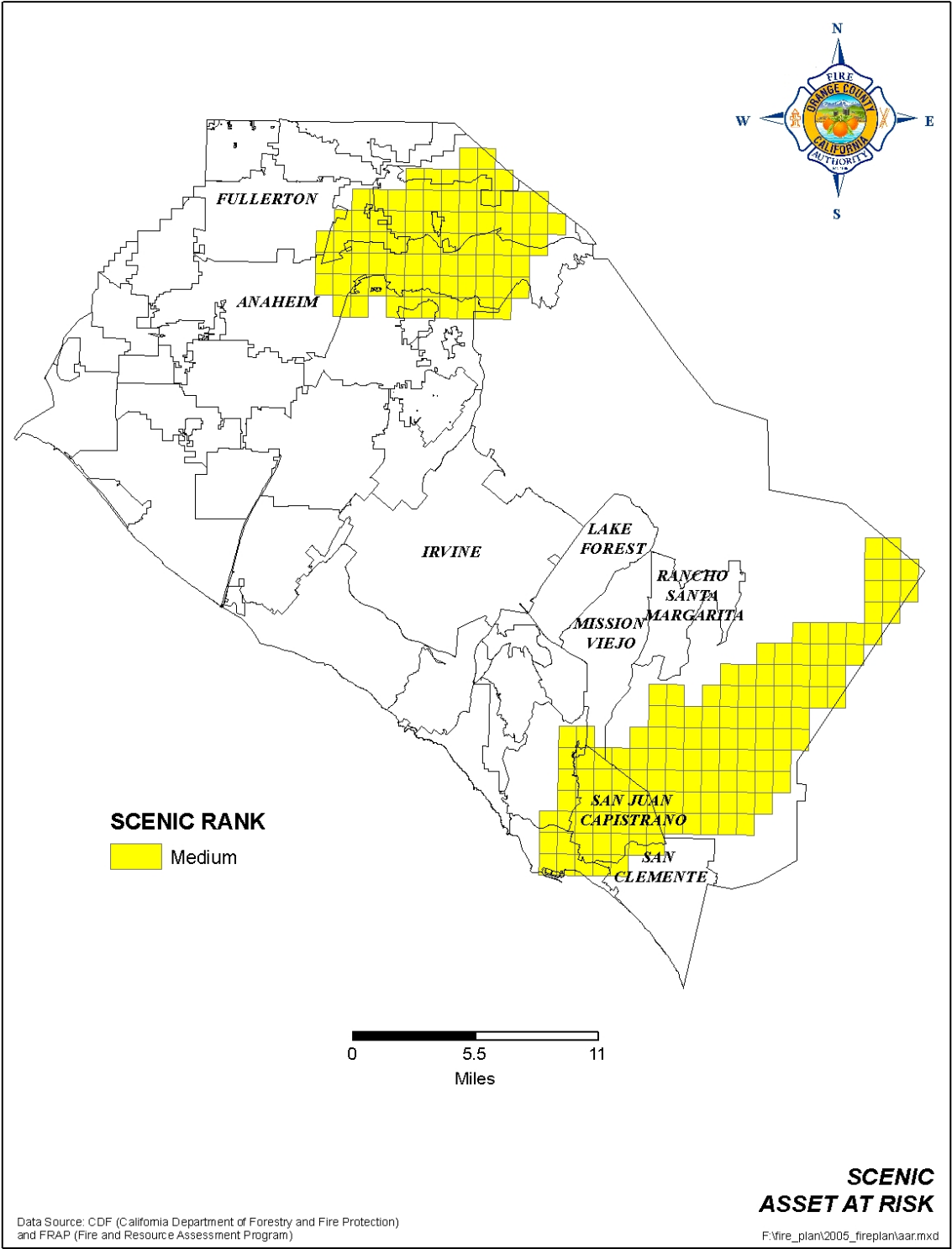


### 3. Scenic

The scenic asset includes the viewshed around state designated Scenic Highways, Forest Service and BLM Scenic Byways, and designated Wild and Scenic Rivers. Scenic highway designations are monitoring based on the CALTRANS web site, [http://www.dot.ca.gov/hq/LandArch/scenic\\_highways](http://www.dot.ca.gov/hq/LandArch/scenic_highways)

Based on conversations with the Forest Service, the visibility zone along roads within which scenic values might be impacted by a large fire event is assumed to be a maximum of four miles, but can be less depending on topography. Within this zone, vegetation type will influence the potential degree of impact on scenic values. For herbaceous and shrub types, the impact is probably less severe, and the duration of impact more limited. For tree types (conifer or hardwood), the impact is potentially more severe and longer lasting. For the statewide analysis, each quad 81<sup>st</sup> is characterized as to whether it is within a scenic area viewshed, and whether the most prevalent vegetation within the cell is a tree or non-tree type. Cells are then ranked according to the following table.

<b>RANK</b>	<b>ROUTE TYPE</b>	<b>VIEWSHED</b>	<b>VEGETATION TYPES</b>
High	State Scenic Highway, Forest Service Scenic Byway, BLM Scenic Byway	Up to four mile viewshed in either direction, subject to topography	Timber, woodland
Medium	State Scenic Highway, Forest Service Scenic Byway, BLM Scenic Byway	Up to four mile viewshed in either direction, subject to topography	Non-tree vegetation
Medium	Designated Wild and Scenic River	1/4 mile viewshed in either direction	Timber, woodland
Low	Designated Wild and Scenic River	1/4 mile viewshed in either direction	Non-tree vegetation
Not ranked	No scenic designation		All



#### 4. Range

The California Fire Plan provides estimates of the cost impact of burning an acre of rangeland for different vegetation types, ownerships, and regions of the state. The impact is based on the replacement cost of oat hay or alfalfa to compensate for lost forage production over a two-year period. While this may not accurately reflect actual losses due to other alternatives such as leasing to compensate for lost forage production, it does provide at least a process for determining the relative rankings of different areas. Using this impact value over all rangelands, many of which are not grazed by livestock, overestimates the actual economic impact. However, in the absence of data for which lands are grazed, it at least provides a relative ranking based on forage production, which has value for wildlife as well as livestock.

For the statewide analysis, each quad 81<sup>st</sup> is assigned its most prevalent range vegetation type, region, and ownership class. Based on these three designations for the cell, an impact value can be derived, and a ranking assigned based on the following table.

<b>RANK</b>	<b>PER ACRE IMPACT</b>	<b>EXAMPLES</b>
High	Over \$35 per acre	North Coast private oak woodland Central Coast private annual grassland
Medium	\$17.50 to \$35 per acre	East Side private sagebrush Central Sierra private oak woodland
Low	Less than \$17.50 per acre	Northern Interior Conifer lands (all owners) Desert (all regions/owners)
Not ranked	\$0	Barren, urban, water



## 5. Air Quality

The California Fire Plan draws on past research to provide estimates of the per acre impact of burning an acre of different vegetation types in various air basins. The estimates attempt to capture impacts on health, materials, vegetation, and visibility. Impacts are much higher for timber and brush than for grass and woodland due to higher emission rates, and for more populous air basins. The following table (from California Fire Plan Appendix C) provides these estimates - for a detailed explanation of how the estimates are derived the reader is referred to the California Fire Plan.

Air Basin	Marginal Emission Value (\$/ton)	Grass and Woodland (\$/acre)	Timber and Brush (\$/acre)	Including Pollution Right Value	
				Grass and Woodland (\$/acre)	Timber and Brush (\$/acre)
<b>San Francisco Bay Area</b>	\$24,258	\$279	\$7,641	\$295	\$8,093
<b>South Central Coast</b>	\$6,441	\$74	\$2,029	\$74*	\$2,029*
<b>South Coast</b>	\$46,458	\$534	\$14,634	\$550	\$15,086
<b>San Diego</b>	\$24,593	\$283	\$7,747	\$283*	\$7,747*
<b>Sacramento Valley</b>	\$2,935	\$34	\$925	\$50	\$1,377
<b>Southeast Desert</b>	\$708	\$8	\$223	\$88*	\$223*
<b>San Joaquin Valley</b>	\$5,184	\$60	\$1,633	\$60*	\$1,633*
<b>North Central Coast</b>	\$6,441	\$74	\$2,029	\$74*	\$2,029*
<b>North Coast</b>	\$1,703	\$20	\$536	\$20*	\$536*
<b>Great Basin Valley</b>	\$125	\$1	\$39	\$1*	\$39*
<b>Northeast Plateau</b>	\$395	\$5	\$124	\$5*	\$124*
<b>Lake Tahoe</b>	\$924	\$11	\$291	\$11*	\$291*
<b>Lake County</b>	\$908	\$10	\$286	\$10*	\$286*
<b>Unweighted Average</b>	\$9,313	\$107	\$2,934	\$111	\$3,038

\* Indicates assumed PM10 pollution right value is zero.

Sources: California Energy Commission 1993, 1995; Air Resources Board 1994.

Each quad 81<sup>st</sup> is assigned its most prevalent vegetation type and the air basin it is within. Based on the associated impact for the vegetation type and air basin, cells are ranked based on following table.

RANK	AVERAGE PER ACRE IMPACT	EXAMPLES
High	Over \$2500 per acre	San Diego air basin brush South Coast air basin brush
Medium	\$500 to \$2500 per acre	South Coast air basin grassland Mountain Counties air basin timberland (1)
Low	Less than \$500 per acre	Northeast Plateau air basin brush North Coast air basin oak woodland

